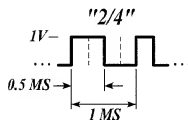
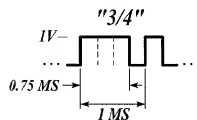
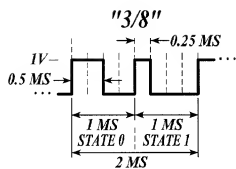
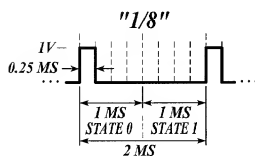
*Fig. 1A**Fig. 1B**Fig. 1C*

Fig. 2

| NUMBER OF UNIT PULSE LENGTHS | MODULATOR BINARY OUTPUT COMBINATIONS | TIMER STATE | EFFECTIVE DUTY CYCLE |
|---------------------------------|--|----------------|----------------------|
| 0 | 0 0 | 0 | = 0% (0/8) |
| | 0 0 | 1 | |
| | 0 0 | 0 | |
| | 0 0 | 1 | |
| 1 | 0 0 | 0 | = 12.5% (1/8) |
| | 0 1 | 1 | |
| | 0 1 | 0 | |
| | 0 0 | 1 | |
| 2 | 0 1 | 0 | = 25% (2/8 = 1/4) |
| | 0 1 | 1 | |
| | 0 1 | 0 | |
| | 0 1 | 1 | |
| | 0 0 | 0 | |
| | 1 0 | 1 | |
| 3 | 1 0 | 0 | = 37.5% (3/8) |
| | 0 0 | 1 | |
| | 1 1 | 0 | |
| | 0 0 | 1 | |
| | 0 1 | 0 | |
| | 1 0 | 1 | |
| 4 | 1 0 | 0 | = 50% (4/8 = 1/2) |
| | 1 0 | 1 | |
| | 1 1 | 0 | |
| | 0 1 | 1 | |
| | 1 0 | 0 | |
| | 1 0 | 1 | |
| 5 | 1 0 | 0 | = 62.5% (5/8) |
| | 1 1 | 1 | |
| | 1 1 | 0 | |
| | 1 0 | 1 | |
| 6 | 1 1 | 0 | = 75% (6/8 = 3/4) |
| | 1 1 | 1 | |
| | 1 1 | 0 | |
| | 1 1 | 1 | |

**Fig. 3A****Fig. 3B**

* INDICATES OVERFLOW BIT

| DUTY CYCLE | POSSIBLE MODULATOR BINARY OUTPUT COMBINATIONS | TIMER STATE |
|-------------|--|----------------|
| 0% (0/8) | 0 0 | 0 |
| | 0 0 | 1 |
| 12.5% (1/8) | 0 1 | 0 |
| | 0 0 | 1 |
| | 0 0 | 0 |
| | 0 1 | 1 |
| 25% (2/8) | 0 0 | 0 |
| | 1 0 | 1 |
| | 1 0 | 0 |
| | 0 0 | 1 |
| | 0 1 | 0 |
| | 0 1 | 1 |
| 37.5% (3/8) | 0 0 | 0 |
| | 1 1 | 1 |
| | 1 1 | 0 |
| | 0 0 | 1 |
| | 0 1 | 0 |
| | 1 0 | 1 |
| | 1 0 | 0 |
| | 0 1 | 1 |
| 50% (4/8) | 0 0 | 0 |
| | 1* 00 | 1 |
| | 1* 00 | 0 |
| | 0 0 | 1 |
| | 0 1 | 0 |
| | 1 1 | 1 |
| | 1 1 | 0 |
| | 0 1 | 1 |
| | 1 0 | 0 |
| | 1 0 | 1 |
| 62.5% (5/8) | 0 1 | 0 |
| | 1* 00 | 1 |
| | 1* 00 | 0 |
| | 0 1 | 1 |
| | 1 1 | 0 |
| | 1 0 | 1 |
| | 1 0 | 0 |
| | 1 1 | 1 |
| | 1* 00 | 0 |
| 75% (6/8) | 1 0 | 1 |
| | 1 0 | 0 |
| | 1* 00 | 1 |
| | 1 1 | 0 |
| | 1 1 | 1 |
| | 1* 00 | 0 |
| 87.5% (7/8) | 1 1 | 1 |
| | 1 1 | 0 |
| | 1* 00 | 1 |
| | 1* 00 | 0 |
| 100% (8/8) | 1* 00 | 0 |
| | 1* 00 | 1 |

Fig.4

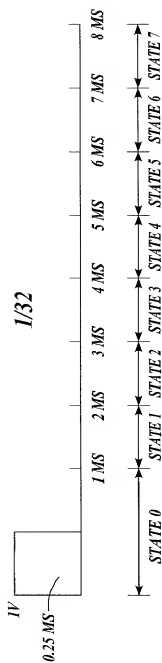


Fig. 5A

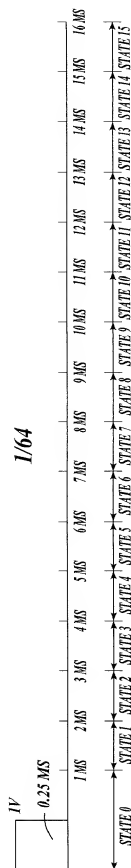
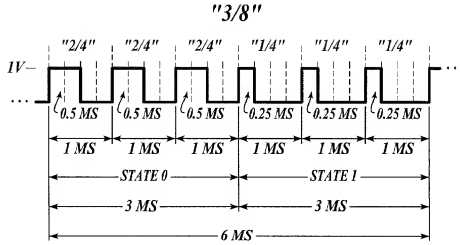
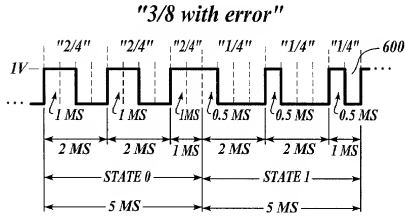


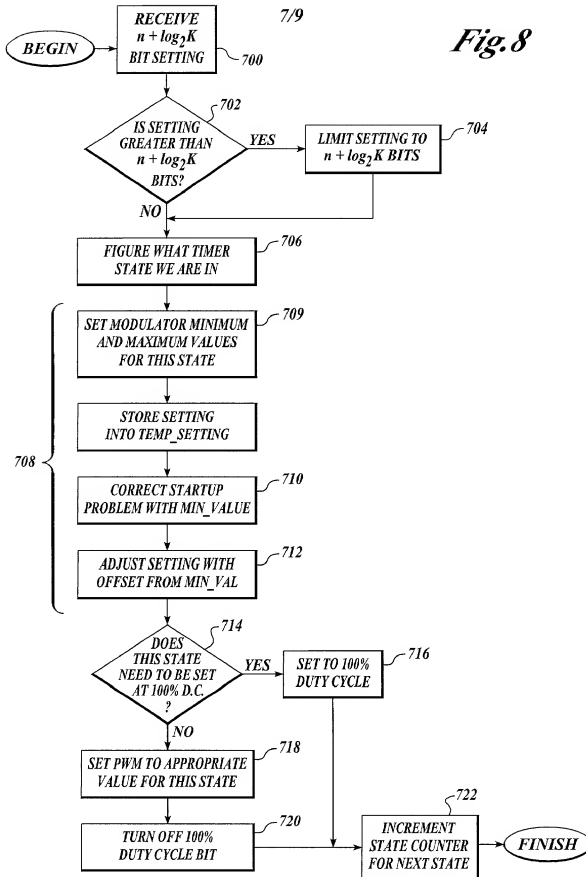
Fig. 5B

*Fig. 6*

PWM PERIOD = 2 MS, TIMER PERIOD = 5 MS

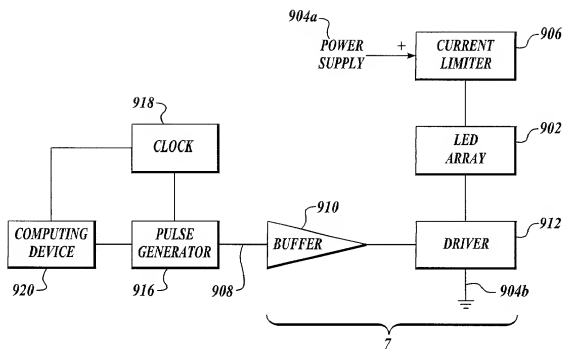
Fig. 7

Fig. 8



| TOTAL PULSE DURATION AS MEASURED IN UNIT PULSE LENGTHS | MODULATOR OUTPUT IN EACH TIMER STATE | | | | | | | |
|---|--------------------------------------|-----|-----|-----|-----|-----|-----|-----|
| | TIMER STATE | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 4 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| 5 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 |
| 6 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 |
| 7 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| 8 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 9 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 10 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| 11 | 2 | 1 | 2 | 1 | 2 | 1 | 1 | 1 |
| 12 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 |
| 13 | 2 | 2 | 2 | 1 | 2 | 1 | 2 | 1 |
| 14 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 1 |
| 15 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 |
| 16 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 17 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 18 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 |
| 19 | 3 | 2 | 3 | 2 | 3 | 2 | 2 | 2 |
| 20 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 2 |
| 21 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 2 |
| 22 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 |
| 23 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 |
| 24 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| ⋮ | ⋮ | ⋮ | ⋮ | ⋮ | ⋮ | ⋮ | ⋮ | ⋮ |
| 2040 | 255 | 255 | 255 | 255 | 255 | 255 | 255 | 255 |
| ⋮ | ⋮ | ⋮ | ⋮ | ⋮ | ⋮ | ⋮ | ⋮ | ⋮ |
| 2047 | 256 | 256 | 256 | 256 | 256 | 256 | 256 | 256 |

Fig.9

*Fig. 10*